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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,370	03/22/2007	Philippe Renaud	SC12993ET	5747

23125 7590 12/30/2009
FREESCALE SEMICONDUCTOR, INC.
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EXAMINER

GOODWIN, DAVID J

ART UNIT	PAPER NUMBER
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2818

NOTIFICATION DATE	DELIVERY MODE
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12/30/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/596,370	Applicant(s) RENAUD ET AL.	
	Examiner DAVID GOODWIN	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 through 5, 9 through 13, 15, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Begley (US 6211056) in view of Howard (US 6396122).

3. Regarding claim 1.

4. Begley teaches a method of making a device. Said method comprises a elongate electrical conductor (242). A sacrificial layer (236) is formed over and across said electrical conductor (242) (fig 4). At least part of said first sacrificial layer (236) is removed leaving a space above and across said conductor (242) (fig 5).

5. Begley does not teach the addition of a magnetic coating.

6. Howard teaches a method of coating an inductor with magnetic particles. Said method comprises providing an elongate electrical conductor (408) with spaces above and across the electrical conductor (404). A fluid (416) comprising magnetic nanoparticles (401) dispersed in a liquid dispersant (416) is introduced into said space (fig 7c). Said liquid dispersant (416) is removed leaving said magnetic nanoparticles (401) densely packed in said space (fig 7c) (column 8 lines 5-50).

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7. It would have been obvious to one of ordinary skill in the art to coating the device of Begley with magnetic particles in order to increase the inductance value of the device.

8. Regarding claim 2.

9. Begley teaches forming a support layer (236) with a cavity (244), forming a electrical conductor (242) over said cavity and forming sacrificial layer (247) overlapping said electrical conductor and cavity (fig 1-4).

10. Begley does not teach the magnetic material.

11. Howard teaches a method of coating an inductor with magnetic particles. Said method comprises providing an elongate electrical conductor (408) with spaces above and across the electrical conductor (404). A fluid (418) comprising magnetic nanoparticles (401) dispersed in a liquid dispersant (416) is introduced into said space (fig 7c). Said liquid dispersant (416) is removed leaving said magnetic nanoparticles (401) densely packed in said space (fig 7c) (column 8 lines 5-50).

12. It would have been obvious to one of ordinary skill in the art to coating the device of Begley with magnetic particles in order to increase the inductance value of the device.

13. Regarding claim 3.

14. Begley teaches a method of making a device. Said method comprises a elongate electrical conductor (242). A first sacrificial layer (150) is formed over and across said electrical conductor (242) and a second sacrificial material (238) is below and across said electrical conductor (242) (fig 4). At least part of said first sacrificial

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layer (150) and second sacrificial material (238) is removed leaving a space encircling said conductor (242) (fig 4).

15. Begley does not teach the addition of a magnetic coating.

16. Howard teaches a method of coating an inductor with magnetic particles. Said method comprises providing an elongate electrical conductor (408) with spaces above and across the electrical conductor (404). A fluid (418 comprising magnetic nanoparticles (401) dispersed in a liquid dispersant (416) is introduced into said space (fig 7a). Said liquid dispersant (416) is removed leaving said magnetic nanoparticles (401) densely packed in said space (fig 7c) (column 8 lines 5-50).

17. It would have been obvious to one of ordinary skill in the art to coating the device of Begley with magnetic particles in order to increase the inductance value of the device.

18. Regarding claim 4.

19. Begley teaches forming a support layer (238) with a cavity and second sacrificial layer (236) in said cavity (fig 1). Forming said electrical conductor (242) over said sacrificial layer (236). And forming said first sacrificial layer (150) overlapping said conductor layer (242) and said second sacrificial layer (236) (fig 4).

20. Regarding claim 5

21. Said support layer (236) comprises an electrically insulating material (column 4 lines 45-60). And said electrical conductor (242) is deposited over said second sacrificial layer (236) and said support layer of insulating material (238) (fig 4) (column 4 lines 25-55).

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22. Regarding claim 9

23. Begley teaches a further layer of sacrificial material (245) is formed above the conductor (242) with at least one aperture corresponding to the space (column 4 lines 40-50).

24. Regarding claim 10.

25. Howard teaches forming a protective layer (930) over the magnetic material (928) (fig 13b) (column 10 lines 10-25)

26. Regarding claim 11.

27. Howard teaches that the magnetic nanoparticles are ferromagnetic (column 7 lines 45-55)

28. Regarding claim 12.

29. Howard teaches iron particles (column 7 lines 45-55)

30. Iron particles inherently have an easy axis of magnetization, the axis along which spontaneous magnetization is more favorable..

31. Regarding claim 13.

32. Howard teaches evaporating the dispersant (fig 7a,b) (column 7 lines 50-65).

33. Regarding claim 15.

34. Begley in view of Howard teaches the device made by the method of claim 1.

35. Regarding claim 16.

36. Begley teaches a meander type inductive element comprising a plurality of substantially parallel electric circuit elements and at one electrical interconnection

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between adjacent ends of the electrical conductor of respective ones of said juxtaposed electrical circuit elements (fig 17).

37. Regarding claim 17.

38. Begley teaches a method of making a device. Said method comprises a elongate electrical conductor (242). A first sacrificial layer (150) is formed over and across said electrical conductor (242) and a second sacrificial material (238) is below and across said electrical conductor (242) (fig 4). At least part of said first sacrificial layer (150) and second sacrificial material (238) is removed leaving a space encircling said conductor (242) (fig 4).

39. Begley does not teach the addition of a magnetic coating.

40. Howard teaches a method of coating an inductor with magnetic particles. Said method comprises providing an elongate electrical conductor (408) with spaces above and across the electrical conductor (404). A fluid (418 comprising magnetic nanoparticles (401) dispersed in a liquid dispersant (416) is introduced into said space (fig 7a). Said liquid dispersant (416) is removed leaving said magnetic nanoparticles (401) densely packed in said space (fig 7c) (column 8 lines 5-50).

41. It would have been obvious to one of ordinary skill in the art to coating the device of Begley with magnetic particles in order to increase the inductance value of the device.

42. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begley (US 6211056) in view of Howard (US 6396122) as applied to claim 5 and further in view of Wang (US 5882985)

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43. Regarding claim 6

44. Begley in view of Howard teaches elements of the claimed invention above.

45. Begley further teaches that the sacrificial material (236) is surrounded by a further layer of material (245) formed over the first layer (238) of insulating material (fig 4 (column 4 lines 25-55)).

46. Begley in view of Howard does not teach that the further layer of material is insulating.

47. Wang teaches forming a masking material (13) of silicon nitride (column 3 lines 5-20).

48. It would have been obvious to one of ordinary skill in the art to form the mask of silicon nitride because it will selectively etch compared to silicon oxide.

49. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begley (US 6211056) in view of Howard (US 6396122) as applied to claim 1 and further in view of Loboda (US 6268262).

50. Regarding claim 7.

51. Begley in view of Howard teaches elements of the claimed invention above.

52. Begley in view of Howard does not teach that the sacrificial material comprises an organic material.

53. Loboda teaches a method of making a metal line on a sacrificial layer. Said sacrificial layer comprises an organic material, removing said sacrificial material comprises dissolving in a solvent (column 4 lines 5-20).

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54. It would have been obvious to one of ordinary skill in the art to use an organic material due to higher etch selectivity.

55. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begley (US 6211056) in view of Howard (US 6396122) in view of Loboda (US 6268262) as applied to claim 7 and further in view of Potter (US 6004830)

56. Regarding claim 8.

57. Begley in view of Howard in view of Loboda teaches elements of the claimed invention above.

58. Loboda further teaches a method of making a metal line on a sacrificial layer. Said sacrificial layer comprises an organic material, exposing said material in a pattern of geometry and selectively removing said sacrificial material comprises dissolving in a solvent (column 4 lines 5-20).

59. Begley in view of Howard in view of Loboda does not the sacrificial organic material is photoresist.

60. Potter teaches that sacrificial polymer is photoresist (column 5 lines 20-40).

61. It would have been obvious to one of ordinary skill in the art to make the sacrificial material of photoresist in order that the solubility may be increased by photo exposure.

62. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begley (US 6211056) in view of Howard (US 6396122) as applied to claim 1 and further in view of Silverschotz (US 5869148).

63. Regarding claim 14.

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64. Begley in view of Howard teaches elements of the claimed invention above.

65. Begley in view of Howard does not teach that the application of a magnetic field.

66. Silvershotz teaches applying a magnetic field to dispersed magnetic particles during the manufacture of magnetic product (column 5 lines 50-60).

67. It would have been obvious to one of ordinary skill in the art to apply a magnetic field to the particles during manufacture in order to cause the poles to align so that the magnetic fields will reinforce each other.

Response to Arguments

68. Applicant's arguments filed 11/3/09 have been fully considered but they are not persuasive.

69. The applicant argues that one would not have combined Begley and Howard, and that Begley teaches away from such a combination (page 6,7).

70. Begley teaches that passivation is omitted, however Howard does not teach forming a passivation but rather a method for providing high permeability particles surrounding the inductor lines. Although there is a superficial resemblance to forming passivation the function of the passivation is not the same as that of high permeability particles. Passivation provides a barrier to physical, chemical and electrical contamination of the conductive line. High permeability particles around the conductive lines of the inductor will increase the inductance of the inductor by confining and guiding the magnetic fields. Begley does not teach away from using a high permeability inductor core and therefore does not teach away from a combination with Howard.

71. The applicant argues that Begley teaches surrounding the conductive lines with air.

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72. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

73. The applicant argues that the combination of Howard and Begley would result in the conductive nanoparticles of Howard adjacent the conductive line of Begley (page 8).

74. First, in response to applicant's argument that the device would short, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

75. Second both Begley and Howard teach that the conductor is enclosed in similar barrier layers which would prevent a hypothesized short.

76. The applicant argues that the claim the prior art does not teach that the conductor is encircled.

77. In response to applicant's arguments, the recitation of "encircled" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural

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limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

78. Further, Howard teaches that the nanoparticles adhere to all exposed surfaces of the conductor (fig 7c). Clearly the nanoparticles surround the conductor, and in an obvious combination where in more surfaces are exposed to nanoparticales the understanding that from the suggestion of the prior art is that all surface would have nanoparticles adhere thereto. The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious." *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

79. The applicant argues that Begley does not teach using magnetic nanoparticles.

80. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

81. The applicant argues that Howard does not teach removing a flowable component of the matrix.

82. The applicant will note that Howard explicitly states "drying" the matrix (column 7 lines 55-65). Drying necessarily means that a liquid is no longer present. Therefore when Howard explicitly teaches drying the flowable dispersant there is no longer a flowable dispersant remaining, it has been removed.

Conclusion

83. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID GOODWIN whose telephone number is (571)272-8451. The examiner can normally be reached on Monday through Friday, 9:00am through 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571)272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

djg

/STEVEN LOKE/

Supervisory Patent Examiner, Art Unit 2818